UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON 25, D. C.

September 17, 1951

TELEPHONE ENGINEERING MEMORANDUM 523

SUBJECT: Specifications for the Treatment and Inspection of Poles, Pole Stubs, Pole Keys, and Anchor Logs Purchased by REA Telephone Borrowers

The attached specifications are tentative and apply to the treatment and inspection of poles, pole stubs, pole keys, and anchor logs purchased by or for REA telephone borrowers. These tentative specifications are effective immediately. Final specifications will be issued later at which time an ample period will be allowed before the effective date of the final specifications to permit suppliers to make any necessary changes.

In certain REA telephone documents the specifications for the treatment and inspection of poles, pole stubs, pole keys, and anchor logs are referred to as "Specifications for the Treatment and Inspection of Treated Timber Purchased by REA Telephone Borrowers." Such references will mean the attached specifications.

The treated products purchased by or for REA telephone borrowers shall be inspected by an inspector approved by REA and representing an inspection agency approved by REA. (See Telephone Engineering Memorandum No. 506). This entails inspection (a) before, (b) during, and (c) after treatment, making sure that every requirement of the specifications is met and making a written report to the interested parties (purchaser, contractor, and REA).

The specifications page 1 paragraph 2.1 REA Approval of Timber Products specifies that each producer who intends to furnish treated timber products for use by REA borrowers must make application and secure acceptance by REA of his products. Many producers will supply both REA telephone and electric borrowers under separate specifications calling for the same requirement. It will not be necessary for such producers to make separate applications, since one application will be sufficient.

Comments on these specifications are invited. Communications should be addressed to the Chief, Technical Standards Division, Rural Electrification Administration.

J. K. O'Shaughnessy

J. K. O'Shaughnessy, Chief
Engineering Division

Attachment

UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Washington 25, D. C.

TENTATIVE SPECIFICATION FOR POLES, POLE STUBS, POLE KEYS AND ANCHOR LOGS USED ON TELEPHONE SYSTEMS OF REA BORROWERS

1.0 SCOPE

These specifications apply to treated forest products in the form of poles, pole stubs, pole keys, and anchor logs that are purchased by or for REA telephone-type borrowers. Where there is a conflict between these specifications and other specifications referred to herein, these specifications shall govern.

2.0 GENERAL STIPULATIONS

2.1 REA Approval of Timber Products

Each producer of treated timber products whose materials are intended for use by REA borrowers must make application and secure acceptance by REA of his products.

Producers who are desirous of obtaining acceptance of their products may secure information and instructions by writing the Chairman, Technical Standards Committee "A," Rural Electrification Administration, Washington 25, D. C. The names of accepted producers will be shown on the "List of Materials Acceptable For Use on Telephone Systems of REA Borrowers." This list will serve as a guide to REA borrowers in the purchase of treated timber products.

2.2 Responsibility of the Producer of Treated Timber Products

It is the primary responsibility of the producer to furnish timber products in accordance with these specifications, notwithstanding the acceptance of any certificate of inspection which may have been given.

The producer shall furnish the inspector a copy of the purchase order or contract, hereinafter referred to as the order pertaining to the physical requirements of the timber products, including drawing numbers constituting that respective part of the contract.

All invoices covering the billing of treated forest products supplied to a borrower, contractor, or jobber shall contain a statement certifying that the treated material listed therein has been inspected by an REA-approved inspection company or firm and meets REA specifications.

2.3 Inspection of Treated Forest Products

The inspection of all timber products must be made by an inspection company approved by REA. Each inspection company shall submit the names of all inspectors together with the brand and hammer number assigned to each and obtain the approval of REA before any inspection work is performed. Payment for the inspection usually will be made by the purchaser. The producer must notify REA in advance of any change that may be made in the inspection arrangement. The purchaser reserves the right to designate the inspection company from the list of approved pole inspection companies.

3.0 MATERIAL AND MANUFACTURING REQUIREMENTS

3.1 Poles (including Pole Stubs)

All poles shall conform to the latest revision of American Standards Association (ASA) (70 E. 45th Street, New York 17, New York) Specifications and Dimensions for Wood Poles 05.1 with the following exceptions and additions:

3.11 Material Requirements

Species shown in Table 1, Page 6 of these specifications are acceptable.

3.12 Sweep

Where sweep is in one plane and one direction only, a straight line joining the edge of the pole at the butt and the edge of the pole at the top shall not be distant from the surface of the pole at any point by more than one (1) inch for each 6 feet of length between these points.

Where sweep is in two planes (double sweep), except in Northern white cedar poles, or in two directions in one plane (reverse sweep) a straight line connecting the mid-point at the butt with the mid-point at the top shall not at any intermediate point pass through the surface of the poles.

3.13 Class 9 and 10 Poles

The minimum dimensional requirements, and species for class 9 and 10 poles shall be in accordance with attachment B.

3.14 Marking (Branding)

Marking (branding) must be distinct and legible, preferably not less than 1/16 inch deep. In addition to the marking specified in ASA Specification 05.1 (latest revision) a numeral(s) indicating the retention in pounds per cu. ft. of preservative shall be placed after the combined designation of species and preservative. Further, an additional "Ten-Foot Mark" located 10 feet from the butt must be cut or burned on the face of the pole. A tolerance of 1 inch plus or minus is permissible.

3.15 Alternative to Branding

The marking may be stamped or embossed on a metal disk that shall be countersunk to a depth not to exceed one quarter of an inch (¼") and nailed or otherwise fastened firmly to the face of the pole. The center of the disk shall be located 10 feet from the butt of the pole. A tolerance of 1 inch plus or minus is permissible.

The disk shall consist of 24 gauge aluminum, shall measure two inches (2") in diameter, and shall have a ridge stamped around its circumference and a nail hole punched in its center.

3.16 Framing

Poles shall be bored, gained, and roofed after seasoning and prior to treatment in accordance with the drawing or drawings submitted with and forming part of the order.

3.17 Incising

Poles of all species that are to be full-length non-pressure treated and poles that are to be butt-treated shall be incised in accordance with the latest revision of AWPA Standard Specification T8.

3.2 Anchor Logs

3.21 Species shown in Table 1, page 6 of these specifications are acceptable.

3.22 Anchor logs shall be clean peeled and sound. The diameter of any single knot shall not exceed one-third the diameter of the log. The diameters and lengths of logs shall be as specified in the order.

3.23 Anchor logs shall be bored as required by drawings or instructions before treatment.

3.3 Pole Keys

Pole keys shall be of structural grade lumber. They shall be cut from sound, rough, square-edged stock of either Douglas Fir, Western Larch, or Southern Yellow Pine. Douglas Fir and Western Larch pole keys shall be incised.

4.0 INSPECTION PRIOR TO TREATMENT

4.1 Poles (including Pole Stubs and Anchor Logs).

All poles shall be inspected prior to treatment for conformance to material and manufacturing requirements (paragraph 3.0 above).

4.11 All poles shall be free of mud or other materials that interfere in any way with proper inspection and treatment.

4.12 Decay

Whenever there is any sign of incipient decay visible in untreated poles and in all cases where the condition of the timber is doubt-

ful, a thin slice (1½" minimum thickness) shall be cut from the butt or tip, or both ends of the poles, so that the pole can be examined for decay.

When there is any evidence of decay such as a softening of the wood, sponginess or brownish discoloration, even though there are no definite areas of breakdown in wood fibres, the material shall be rejected.

4.13 Acceptance Preparatory to Treatment

On accepting the pole preparatory to treatment, the inspector shall stamp his distinctive hammer mark on the top of the pole. (The class and length shall have been clearly branded on the face of the pole and stamped in the butt of each pole by the supplier before poles are offered for inspection.)

4.14 Time Interval Between Preliminary Inspection and Treatment

Preliminary inspection shall be made at the treating plant. In order to insure that all poles and pole stubs that have passed preliminary inspection shall not have deteriorated before being treated, the interval between preliminary inspection and treatment shall not exceed 10 days.

4.2 Pole Keys

Preliminary inspection shall be made at the treating plant. On accepting the pole keys preparatory to treatment, the inspector shall stamp his distinctive hammer mark on one end of each key.

5.0 CONDITIONING

5.1 Poles (including Pole Stubs and Anchor Logs) that are to be Pressure Treated

5.11 Conditioning of poles shall be in accordance with AWPA Standards for respective species.

5.2 Poles (including Pole Stubs and Anchor Logs) that are to be Full-Lengh Non-Pressure Treated or Butt-Treated

All poles shall be thoroughly air-seasoned so that they can be treated satisfactorily to meet the penetration requirements on Table 1, page 6. In case of doubt an average moisture content of not to exceed 25 percent (based on oven dry weight of wood) in the sapwood portion shall be considered a measure of adequate air-seasoning. Moisture content of the sapwood may be determined from the sapwood portion of either increment borer cores or auger shavings extracted from representative pieces. Either the oven drying or distillation methods described in Forest Products Laboratory (Madison, Wisconsin) Report No. R1649 is recommended for the determination of moisture content in wood.

5.3 Pole Keys

Pole Keys shall be conditioned according to the latest revision of the AWPA Specifications T1 and T2.

6.0 PRESERVATIVE TREATMENT

6.1 Poles (Including Pole Stubs and Anchor Logs)

6.11 Pressure Treatment Process

Pressure treatment of poles shall be in accordance with latest standards of the American Wood Preservers Association (AWPA) (839 17th Street, N.W., Washington, D. C.) AWPA "Manual of Recommended Practice," except as noted in Section 6.13 and in Table 1.

6.12 Non-Pressure Treatment Process

The air-seasoned poles shall be immersed in the hot preservative for a period of not less than 4 hours at 212° to 235° F., followed by immersion in the cold bath at 100° to 150° F. for a period long enough to produce the required depth of penetration (see Table 1). Full-length treated poles shall be completely immersed and tops and butts shall be treated simultaneously. Butt-treated poles shall be treated to the height indicated in the latest AWPA Standard Specification T8.

6.13 Retention and Penetration Requirements According to Pole Species and Treating Processes

These requirements are listed in Table 1.

The general requirements of AWPA Standards T1 and T4 shall apply to the pressure treatment of all poles, pole stubs and anchor logs. AWPA Standard T8 shall apply to the non-pressure treatment of Northern White Cedar, Western Red Cedar, Western Larch and Lodgepole Pine. When REA requirements, particularly as to retentions and penetration, differ from AWPA Standards, the REA requirements shall be followed.

6.14 Sapwood Thickness

Since difficulty may be encountered in securing the specified retentions and penetrations, poles shall be selected for treatment that have sufficient sapwood thickness and are sufficiently conditioned to permit obtaining the retentions and penetrations specified.

6.15 Refusal Treatment

Refusal treatment in lieu of 8 pounds per cubic foot is acceptable in coast type Douglas Fir, Western Red Cedar, and Northern White Cedar where it is impractical to obtain retentions specified. Refusal treatment of Intermountain Douglas Fir is not acceptable where 10 pounds per cubic foot retention is required, but is acceptable in lieu of 8 pounds per cubic foot retention if the

3/4-inch penetration is met. Treatment to refusal shall be defined as the treatment of timber by pressure until absorption of the preservative practically ceases under application of the maximum permitted pressure.

TABLE 1 REA SPECIFICATIONS FOR THE TREATMENT OF POLES

Species	Process	Minimum Net Retention	Required Sapwood Penetration
Southern Yellow Pine	Pressure	Group A & B, 10#	3" or 90%
	**Pressure	**Group A 8#	2½" or 85%
Lodgepole Pine	Pressure	Group A & B, 8#	1½" or 85%, Min. ½"
	*Pressure	*Group A 6#	1½" or 85%, Min. ½"
	FLNP	Group A & B	1½" or 85%, Min. ½"
	*FLNP	*Group A	3/4" or 100%, Min. ½"
	*Butt	*Group A	3/4" or 100%, Min. ½"
Douglas Fir	Pressure	Group A & B, 10#	1 5/8" or 85%, Min. 3/4"
	**Pressure	**Group A 8#	1 5/8" or 85%, Min. 3/4"
Western Redcedar	Pressure	Group A & B, 8#	85%
	FLNP	Group A & B,	1/2" or 100%
	*Butt	*Group A	1/2" or 100%
Jack Pine	Pressure	Group A & B, 8#	1 1/2" or 85%
	*Pressure	*Group A 6#	1 1/2" or 85%
Northern White Cedar	Pressure	Group A & B 8#	85%
	FLNP	Group A & B	1/2" or 100%
	*Butt	*Group A	1/2" or 100%
Red (Norway) Pine	Pressure	Group A & B, 8#	2 1/2" or 85%
Ponderosa Pine	Pressure	Group A & B, 10#	3" or 90%
	**Pressure	**Group A 8#	2 1/2" or 85%
Western Larch	Pressure	Group A & B, 8#	85%, Min. 1/2"
	*Pressure	*Group A 6#	85%, Min. 1/2"
	FLNP	Group A & B	85%, Min. 1/2"
	*FLNP	*Group A	1/2"
	*Butt	*Group A	1/2"

*Poles with this treatment are restricted to use in the semi-arid areas found between Meridians 100 degrees and 120 degrees West as established by REA.
**Poles with this treatment are not acceptable in the area South of the 40th Parallel and East of the 100th W. Meridian.

Group "A" and "B" Douglas Fir, Ponderosa Pine and Southern Yellow Pine must be treated with 10# retention of preservative for use in the area South of the 40th parallel and east of the 100th W. Meridian.

Group "B" Poles for use in any area must be treated in accordance with the highest requirements of their respective species.

Group A - poles having a circumference of less than 37½ inches at 6 feet from the butt (Exception: 40 inches for cedars).

Group B - poles having a circumference of 37½ inches or more at 6 feet from the butt (Exception: 40 inches for cedars).

6.2 Pole Keys

Treating Process, Retention, and Penetration
The preservative treatment of pole keys shall be in accordance with the latest AWPA Standard Specifications T1 and T2. The retention of preservative shall be 10 pounds per cubic foot.

7.0 INSPECTION AFTER TREATMENT

7.1 Poles (including pole stubs and anchor logs)

7.11 Determination of Penetration of the Preservative in Pressure Treated Poles

Taking of increment borer cores and acceptance of poles shall be in conformance with the latest AWPA Standard Specification T4. All holes made for determination of penetration of preservative shall be filled with tight-fitting treated plugs.

7.12 Determination of Penetration of the Preservative in Full-Length Non-Pressure and Butt Treated Poles

Acceptance of poles shall be in accordance with the latest AWPA Standard Specification T8. All holes made for determination of penetration shall be filled with tight-fitting treated plugs.

7.13 Determination of Retention of the Preservative

The inspector shall determine the retention of preservative by the quantity consumed in the process, as outlined in the latest AWPA Standard Specification T1. The volume of the poles being treated shall be determined by use of Volume Tables given in Attachment "A." These tables are based on poles of average 6 feet-from-butt circumference for each length and class and reflect the fact that different species taper at different rates. Table 3 of the latest AWPA Standard Specification M6, "Standard Volumes of Round Forest Products" shall be used for stubs and anchor logs.

7.14 Inspector's Acceptance

On accepting the pole or pole stubs, after final inspection the inspector shall stamp his distinctive hammer mark on the butt. Hammering after treatment is not required for anchor logs.

7.2 Pole Keys

7.21 Determination of Penetration of the Preservative

Increment borer cores shall be taken as outlined in the latest AWPA Standard Specification T1 and T2.

7.22 Determination of Retention of the Preservative

The retention shall be determined by the quantity of preservative consumed and the volume of wood in any charge according to the latest AWPA Standard Specification T1.

7.23 Inspector's Acceptance after Treatment

To avoid repeated handling the inspector need not stamp his hammer mark on the treated pole keys.

8.0 PRESERVATIVES

8.1 Creosote

This preservative shall be Grade 1 Coal-Tar Creosote and shall be in accordance with the latest AWPA Standard Specification P1, "Standard Specification for Creosote." "C" is the branding code designation for this preservative.

8.11 Analysis of Creosote

The analysis shall include a determination of the specific gravity of fractions distilling between 235-315°C. and 315-355°C.

1. The specific gravity of fractions distilling between 235° and 315°C. shall not be lower than 1.025 @ 38°C. compared with water at 15.5°C.

2. The specific gravity of fractions distilling between 315° and 355°C. shall not be lower than 1.085 @ 38°C. compared with water at 15.5°C.

8.2 Petroleum Oil Containing 5 Percent Pentachlorophenol*

"P" is the branding code designation for this preservative. Methods of treatment recommended for creosote are also recommended for this preservative. The oil used in preparing the solution shall conform to the following specifications:

8.21 Petroleum Oil (Carrier for Pentachlorophenol)

8.211 It shall not be too viscous to meet penetration requirements satisfactorily at the temperature specified in the latest applicable AWPA Standards. It shall not form objectionable

*During the limited number of years this preservative has been in commercial use, it has given favorable results but its effectiveness has not yet been fully evaluated.

8.21 Petroleum Oil (Carrier for Pentachlorophenol) Cont'd.

sludge when mixed and repeatedly used in the treating solution.** When used with pentachlorophenol alone, it shall be dark enough in color to be readily observed in sections of borings of the treated wood.

8.212 It shall have a specific gravity of not less than 0.9041 at 15.5°/15.5°C. (This corresponds to an A.P.I. gravity of not higher than 25.0 at 60°/60°F.)

8.213 It shall have a flash point of not less than 190°F., as determined by a Pensky-Martens closed tester (Lastest ASTM Standard D-93) or 210°F. by the Cleveland open cut method.

8.214 The pentachlorophenol solvency of the petroleum oil shall be not less than 10 percent by weight at 75°F. when determined by the method given in the 1947 Report of AWPA Preservatives Committee referred to in 8.211 above.

8.215 The total volume of the fractions distilling below 500°F. shall not be more than 50 percent (Latest ASTM Standard D-158.)

8.22 Pentachlorophenol

Pentachlorophenol shall conform to the latest Federal Specification TTW-570.

** Maximum sludge formation shall be 0.5 percent (sludge minus sediment) as determined by the method proposed in appendix C of Report of Committee 4 Preservatives, AWPA 1947.

APPENDIX A

VOLUMES OF SOUTHERN PINE POLES

- CUBIC FEET -

Class

Length of Pole -Ft.-	1	2	3	4	5	6	7	9*	10*
16					4.2	3.6	3.0	2.5	2.0
18			6.9	5.9	5.0	4.2	3.4	2.8	2.4
20	12.9	10.3	8.5	7.1	6.0	5.1	4.3	3.6	2.9
22	15.0	12.2	10.1	8.4	7.2	6.1	5.1	4.2	3.4
25	18.0	14.7	12.3	10.4	8.9	7.6	6.3	5.2	4.2
30	23.2	19.6	16.7	14.2	12.0	10.0	8.3	7.2	
35	28.5	24.4	21.0	18.2	15.6	13.5	11.7		
40	34.3	29.5	25.5	22.1	19.2	16.8	14.6		
45	40.4	34.7	30.2	26.3	23.1	20.3	17.8		
50	47.0	40.2	35.0	30.6	27.1	24.1	21.3		
55	54.1	46.6	40.0	35.1	31.3	28.4			
60	62.8	53.5	45.6	39.8	35.5	32.7			
65	73.0	60.8	51.1	44.6	40.6				
70	84.0	68.7	57.1	49.6	45.2				
75	94.5	77.0	63.8	54.9					

VOLUMES OF DOUGLAS FIR POLES

- CUBIC FEET -

Class

Length of Pole -Ft.-	1	2	3	4	5	6	7	9*	10*
16					4.4	3.8	3.2	2.6	2.1
18			7.2	6.2	5.3	4.4	3.6	2.9	2.5
20	13.5	10.8	8.9	7.5	6.3	5.4	4.5	3.8	3.0
22	15.8	12.8	10.6	8.8	7.6	6.4	5.4	4.4	3.6
25	18.9	15.4	12.9	10.9	9.3	8.0	6.6	5.5	4.4
30	24.4	20.6	17.5	14.9	12.6	10.5	8.7	7.5	
35	29.9	25.6	22.1	19.1	16.4	14.2	12.3		
40	36.0	31.0	26.8	23.2	20.2	17.6	15.3		
45	42.4	36.4	31.7	27.6	24.3	21.3	18.7		
50	49.4	42.2	36.8	32.1	28.5	25.3	22.4		
55	56.8	48.9	42.0	36.9	32.9	29.8			
60	65.9	56.2	47.9	41.8	37.3	34.3			
65	76.7	63.8	53.7	46.8	42.6				
70	88.2	72.1	60.0	52.1	47.5				
75	99.2	80.9	67.0	57.6					

* In accordance with specified minimum dimensions set up for these classes. (See Appendix B)

APPENDIX A

VOLUMES OF LODGEPOLE PINE, JACK PINE AND RED PINE POLES

Length of Pole - Ft. -	- Cubic Feet - Class 1	2	3	4	5	6	7	9*
16					4.5	3.8	3.2	2.7
18			7.4	6.3	5.3	4.5	3.6	3.0
20	13.7	11.0	9.1	7.5	6.4	5.4	4.5	3.8
22	16.0	13.0	10.7	8.9	7.6	6.4	5.4	4.4
25	19.1	15.6	13.0	11.0	9.4	8.0	6.6	5.5
30	24.6	20.7	17.6	15.0	12.6	10.5	8.7	7.5
35	30.1	25.7	22.1	19.1	16.3	14.1	12.2	
40	36.2	31.0	26.8	23.1	20.1	17.5	15.2	
45	42.4	36.4	31.6	27.5	24.0	21.0	18.4	
50	49.4	42.0	36.6	31.8	28.2	24.9	21.9	
55	56.5	48.7	41.6	36.3	32.4	29.3		
60	65.6	55.4	47.4	41.2	36.6			
65	75.9	63.2	52.9	45.9				
70	87.4	71.1	58.8					
75	97.8	79.7						

VOLUMES OF PONDEROSA PINE POLES

Length of Pole - Ft. -	- Cubic Feet - Class 1	2	3	4	5	6	7	9*
16					4.8	4.1	3.4	2.8
18			1.9	6.7	5.7	4.8	3.9	3.2
20	14.7	11.7	9.7	8.1	6.8	5.8	4.9	4.1
22	17.1	13.9	11.5	9.5	8.2	6.9	5.8	4.7
25	20.4	16.7	14.0	11.8	10.1	8.6	7.1	6.2
30	26.3	22.2	18.9	16.0	13.5	11.3	9.3	7.9
35	32.3	27.6	23.7	20.5	17.5	15.2	13.1	
40	38.8	33.3	28.8	24.8	21.6	18.8	16.3	
45	45.6	39.1	33.9	29.5	25.9	22.6	19.9	
50	52.9	45.1	39.3	34.2	30.3	26.9	23.7	
55	60.7	52.3	44.7	39.2	34.9	31.6		
60	70.5	59.6	51.0	44.4				
65	81.6	68.0	57.0	49.6				
70	93.9	76.7						
75	105.4	85.5						

* In accordance with specified minimum dimensions set up for these classes. (See Appendix B)

APPENDIX A

VOLUMES OF WESTERN LARCH (TAMARACK) POLES

Length of Pole - Ft. -	- CUBIC FEET - Class 1	2	3	4	5	6	7	9*
16					3.9	3.3	2.8	2.3
18			6.3	5.4	4.6	3.9	3.1	2.6
20	11.9	9.5	7.8	6.5	5.5	4.7	4.0	3.3
22	13.8	11.2	9.3	7.7	6.6	5.6	4.7	3.9
25	16.6	13.5	11.3	9.6	8.2	7.0	5.8	4.8
30	21.3	18.0	15.4	13.1	11.0	9.2	7.6	6.6
35	26.2	22.4	18.3	16.7	14.4	12.4	10.8	
40	31.6	27.1	23.5	20.3	17.7	15.5	13.4	
45	37.2	31.9	27.8	24.2	21.3	18.7	16.4	
50	43.2	37.0	32.2	28.2	24.9	22.2	19.6	
55	49.8	42.9	36.8	32.3	28.8	26.1		
60	57.8	49.0	42.0	36.6	32.7			
65	67.2	55.9	47.0	41.0				
70	77.3	63.2	52.5					
75	86.9	70.8						

VOLUMES OF WESTERN RED CEDAR POLES

Length of Pole - Ft. -	- CUBIC FEET - Class 1	2	3	4	5	6	7	9*
16					5.0	4.3	3.5	3.0
18			8.3	6.9	6.0	5.1	4.3	3.5
20	12.5	11.0	9.5	8.1	7.0	6.0	5.1	4.0
22	14.4	12.8	11.0	9.4	8.2	7.0	6.0	4.6
25	17.5	15.6	13.5	11.5	10.1	8.7	7.5	6.3
30	23.2	20.5	17.9	15.3	13.4	11.7	10.3	8.5
35	29.6	26.0	22.7	19.6	17.2	15.2	13.4	
40	36.5	32.1	27.7	24.1	21.5	19.1	16.8	
45	43.7	38.2	33.4	29.1	26.0			
50	51.7	45.4	39.2	34.2	31.1			
55	59.8	52.3	45.6	40.3	36.3			
60	68.3	59.6	51.9	46.4				
65	77.0	67.5	58.5	52.3				
70	86.5	75.3	65.8	59.1				
75	95.5	84.0	73.5	65.0				

* In accordance with specified minimum dimensions set up for these classes (See Appendix B)

APPENDIX A

VOLUMES OF NORTHERN WHITE CEDAR POLES

- CUBIC FEET -

Length of Pole - Ft. -	Class 1	2	3	4	5	6	7	8	9*
16					6.0	5.0	4.1	3.6	3.5
18			10.0	8.3	7.0	5.8	5.0	4.5	4.1
20	16.5	14.0	11.7	9.8	8.3	6.8	6.0	5.3	4.9
22	18.8	16.0	13.6	11.5	9.6	8.1	7.1	6.2	5.6
25	24.1	19.4	16.5	14.1	11.7	9.9	8.7	7.7	7.0
30	30.0	25.7	21.9	18.8	15.9	13.6	11.8	10.6	9.3
35	37.7	32.5	27.8	23.8	20.4	17.6	15.0	13.8	
40	46.4	40.1	34.2	29.2	25.3	22.0			
45	56.0	48.2	41.2	35.4	30.8				
50	66.1	56.8	48.8	42.0	36.6				
55	76.7	65.9	56.7	49.2	43.2				
60	87.5	75.0	65.0	56.5					

* In accordance with specified minimum dimensions set up for these classes (See Appendix B).

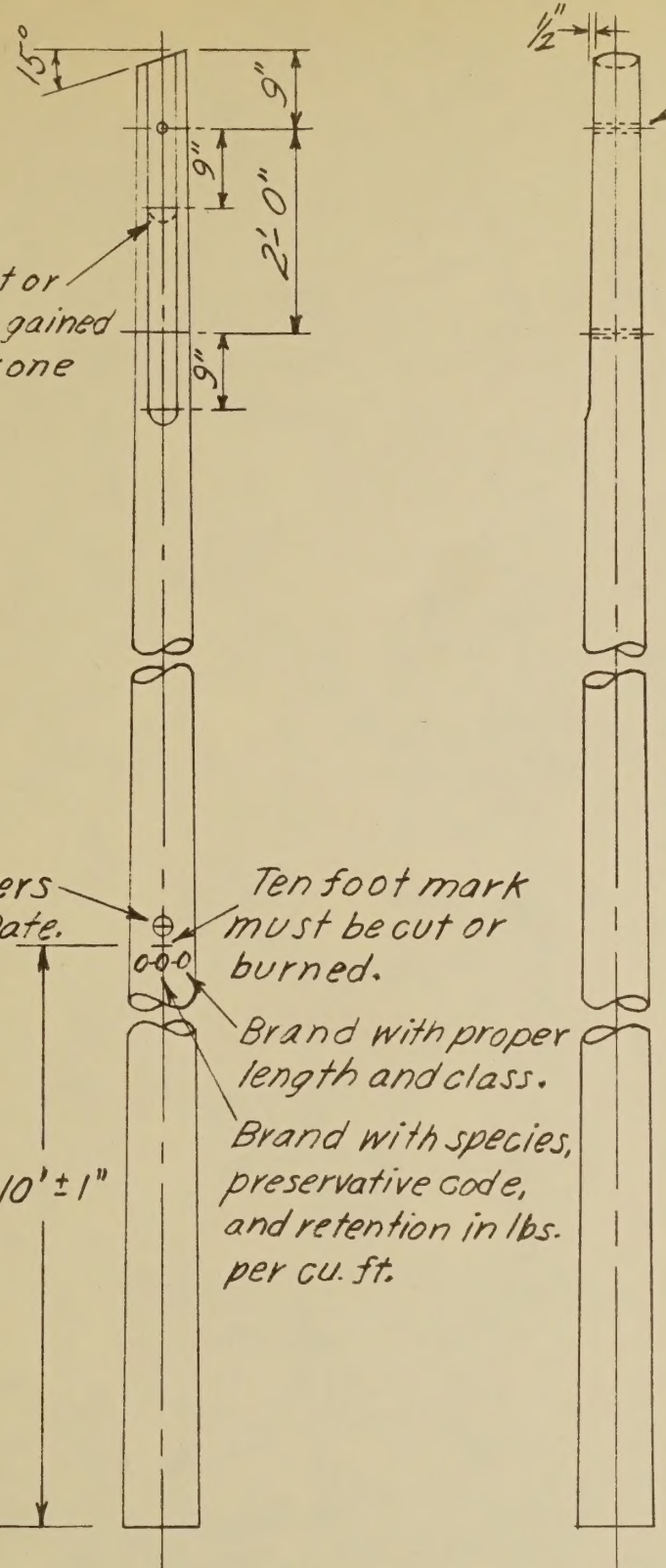
APPENDIX B

Minimum Dimensions for Class 10 Poles

Pole Length Feet	Top Circ. = 12.0 in. and circ. 6 ft. from butt in inches, to be:		
	Jack Pine Lodgepole Pine Red (Norway) Pine	Douglas Fir Southern Pine	Western Larch
16	13.5	13.0	12.5
18	14.0	13.5	13.0
20	14.5	14.0	13.5
22	15.0	14.5	14.0
25	15.5	15.0	14.5

Minimum Dimensions for Class 9 Poles

Pole Length Feet	Top Circ. = 15.0 in. and circ. 6 ft. from butt in inches, to be:					
	Jack Pine Lodgepole Pine Red (Norway) Pine	Southern Pine Douglas Fir	Ponderosa Pine	Northern White Cedar	Western Red Cedar	Western Larch
16	16.5	16.0	17.0	20.0	17.5	15.5
18	17.5	17.0	18.0	21.0	18.5	16.5
20	18.0	17.5	18.5	22.0	19.0	17.0
22	19.0	18.5	19.5	23.0	20.0	17.5
25	20.0	19.5	20.5	24.0	21.0	18.5
30	21.0	20.5	22.0	26.0	22.5	19.5



Poles 20 feet or less should be gained and drilled for one crossarm only.

Thru bolt holes must be parallel and in the same plane.

Holes-
Drill 11/16" diameter

Gains-
Gains are to be flat, with plane at right angles to bolt holes.

All poles treated full-length must be bored, roofed and gained before treatment.

Manufacturers Mark and Date.

Ten foot mark must be cut or burned.

Brand with proper length and class.

Brand with species, preservative code, and retention in lbs. per cu. ft.

10' ± 1"

For field gains on full-length treated poles, metal gains are preferred.

Flat Roof-
Flat roofs may be cut on all full-length treated poles before treatment.

When metal disk is used for branding, center of disk must be ten feet from butt of pole.

Brand butt with proper length and class.

Brand with species and preservative code.

	Pole Framing	
Scale: 1/2" = 1'-0"		Date: Aug. 14, 1951 Drawing No. 801